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Case Report

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Treatment of Miller class 3 gingival recession with free gingival graft and creeping attachment phenomenon: 2 case reports; 2-year follow-up

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ABSTRACT

Periodontal plastic surgical procedures applied to regulate the gingival-mucosa relations that complicate periodontal diseases and affect the success of periodontal treatment are referred to as mucogingival surgery. It is known that complete root surface closure can be achieved in mucogingival surgical procedures to be applied in patients without interproximal bone loss. However, recent studies suggest that patients with bone loss can also be treated successfully. The movement of the marginal edge of the gingiva towards the coronal margin after mucogingival surgery is defined as 'creeping attachment'. This case report aims to emphasize the importance of creeping attachment after free gingival grafting in patients with Miller class 3 gingival recession. Intraoral and radiologic examinations of 2 systemically healthy, non-smoking female patients aged 27 and 28 years showed mild to moderate periodontal bone loss and were diagnosed as stage 1 periodontitis. Patients with frenulum recession and gingival recession in the mandibular incisor region had Miller class 3 recession. Free gingival graft was applied to the patients and the changes in the graft and gingival recession area and creeping attachment were observed for 2 years. After free gingival grafting, in addition to the initial postoperative root surface closure in patients with Miller class 3 gingival recession, it was observed that the size of the gingival recession decreased or the root surface closure rate increased with creeping attachment over time.

Keywords: Free gingival graft, creeping attachment, mucogingival surgery, gingival recession

INTRODUCTION

Gingival recession is a common condition encountered in the society and is defined as the displacement of the gingival margin towards the apical part of the enamel-cementum junction.[1] It has been shown in studies that gingival recession increases with age, especially in young people, recession is seen mostly on buccal surfaces and affects interproximal areas in advanced ages.[2]

Gingival recession may occur for many reasons. One of the most important causes is plaque-related inflammation of the gingiva. Incomplete oral hygiene due to insufficient amount of keratinized gingiva, tooth movements caused by forces applied in orthodontic treatments, abnormal muscle and frenulum connections and occlusal trauma may also cause gingival recession.[3] Tooth brushing habits, bristle thickness, brushing technique, brushing force and frequency have been associated with gingival recession, especially on buccal surfaces.[4,5]

Along with aesthetic problems, gingival recession may cause dentin sensitivity, root caries, cervical lesions, exacerbation of periodontal diseases due to plaque accumulation and eventually tooth loss. These conditions can be treated with mucogingival surgery.[6,7] Today, the main goal of mucogingival surgery is the correction of defects related to gingival recession and very successful results are obtained in the treatment of these problems with free gingival graft applications.[7]

Free gingival grafts, which were previously used only to increase the width of keratinized gingiva, are among the mucogingival surgical procedures that have been successfully used to cover the root surface in gingival recession, to eliminate abnormal frenulum and muscle attachments, and to provide patients with an appropriate gingival-mucosa relationship where they can provide effective oral hygiene.[8] However, it is recommended to be used in the premolar region and lower anterior region because the color and texture characteristics are not fully compatible.[1,9]

In 1968, Sullivan and Atkins outlined the surgical principles of free gingival graft application in isolated gingival recession. By placing the free gingival graft on the avascular bare root surface, a permanent bridge is obtained and primary closure of the root surface is achieved.[10] In addition to this primary closure, Goldman described the secondary root surface closure that occurs over time as creeping attachment.[11] This passive covering process that occurs after surgery has been

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described by many authors as migration of the gingiva towards the coranal.[12,13]

In this case report, dimensional change and creeping attachment were observed within two years after the primary closure of the root surface with free gingival graft treatment applied to different patients, and the secondary root surface closure that occurs over time was demonstrated. It has been shown that favorable results can be obtained with free gingival grafting in patients with interproximal periodontal bone loss. At the same time, it is aimed to demonstrate the conditions that can be achieved by waiting before deciding to perform a second surgical procedure in root surfaces that are not completely closed after the surgical procedure.

CASE 1

A systemically healthy 27-year-old woman was admitted to Dicle University, Faculty of Dentistry, Department of Periodontology with bleeding, pain and gingival recession. She was a non-smoker and brushed her teeth once a day. Bleeding on probing, extensive calculus accumulation and minimal bone loss radiologically not exceeding the coronal part of the root were observed. The patient had stage 1 periodontitis and Cairo type 2 (Miller class 3) gingival recession with abnormal frenylum attachment and shallow vestibular sulcus depth in the mandibular incisors. Phase 1 periodontal treatment (scaling, root planing and oral hygiene instructions) was performed. After the gingival index and plaque index scores were zeroed, a free gingival graft operation was planned (**Figure 1a**). Informed consent was obtained for the operation. In teeth 31 and 41, root surface smoothing was performed using gracey curettes (Hu-Friedy® Gracey curette, Chicaho, USA). The operation was continued with intrasulcular incisions made at the gingival sulcus of the teeth and horizontal incisions to coincide with the enamel-cementum border. Afterwards, vertical incisions were made distal to both teeth starting from the end of the horizontal incisions and extending to 3-4 mm apical to the extraction defects. With sharp dissection, the frenylum and muscle attachments were completely eliminated and an immobilized recipient bed was created. The palatinal palate region of the patient was used as the donor site and a 2 mm thick free gingival graft was obtained under local anesthesia in accordance with the shape of the recipient site and the palate was sutured with 3/0 silk suture after controlling bleeding. The free gingival graft was immobilized in the recipient bed using 5/0 non-resorbable polyamide suture (**Figure 1b**).

Figure 1. a) Preoperative intraoral view of the patient, b) Free gingival graft application and suturing

Figure 2. a) Intraoral image 14 days after surgery, b) Intraoral image 6 months after the operation

The patient was given a post-op order. Analgesics, anti-inflammatories and antibiotics were prescribed for 1 week (Eto-dolac 400 mg tablet and Amoxicillin/Clavulanic acid 625 mg film tablet). She was asked to continue 0.12% chlorhexidine gluconate mouthwash for 15 days, to protect the area from any trauma and not to brush the operation area for 15 days. After 14 days, sutures were removed (**Figure 2a**). Afterwards, the patient was called for follow-up visits at 6, 12 and 24 months and the changes in the free gingival graft were observed (**Figure 2b, 3a, 3b**).

At the time of suture removal, it was seen that the gingival margin was not in the desired area in the collar region in both teeth and there was a gingival recession of 1 mm in tooth number 41 and 2.5 mm in tooth number 31. At the 6-month to 1-year controls, a complete root surface closure was obtained in tooth number 41 with creeping attachment in the tissue that was left to heal passively, while a 1.5 mm closure was achieved in tooth number 31. Between the 1st and 2nd year, creeping attachment was slower and less frequent. The final result was satisfactory for the patient and the patient's complaints were completely resolved.

CASE 2

A 28-year-old systemically healthy, non-smoking female patient was admitted to our clinic with complaints of bleeding, pain, gingival recession and tenderness. Abnormal frenulum recession in the region of the mandibular incisors, bone loss in the interdental regions and Cairo type 2, miller class 3

Figure 3. a) Intraoral image 1 year after the operation, b) Intraoral image 2 years after the operation

of the gums were detected. Intraoral and radiologic examination revealed Stage 1 periodontitis with bone loss not exceeding the coronal triangle of the root. Detethering, subgingival curettage, root surface smoothing were performed and the patient was followed up until the intraoral scores became appropriate and oral hygiene was expected to stabilize (**Figure 4**).

Figure 4. Intraoral image of the patient after phase 1 treatment

After the initial treatment, it was decided to apply free gingival graft to the lower incisor area where the patient's complaints were maximal. The first incision was made parallel to the mucogingival line, leaving free gingiva in the collar region of the teeth. In the recipient bed, the frenulum was completely neutralized and a suitable immobilized bed was created (**Figure 5a**).

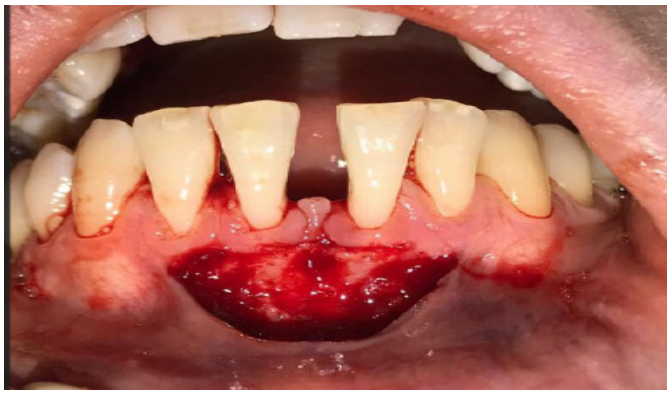

Figure 5. a) Preparation of the recipient bed, b) Suturing the free gingival graft to the recipient bed

The free gingival graft taken from the palate was fixed to the area using simple sutures, horizontal matrix sutures and pressure sutures. Pressure was applied on the graft with a wet spacer to prevent dead space under the graft (**Figure 5b**). The patient was prescribed analgesic, anti-inflammatory, antibiotic and chlorhexidine mouthwash. She was asked not to brush the area for 2 weeks and to protect it from trauma. After 14 days, there was no necrosis when the sutures were removed.

After 6 months, creeping attachment increased, however, the free gingival graft appeared quite protruding on the tissue and its form was not at the desired level **Figure 6a, 6b**). At the end of the 2nd year, it was seen that the graft compliance increased and root coverage was maximized (**Figure 7a, 7b**).

Figure 6. a) Image of the patient after 1 month, b) Intraoral image after 6 months

Figure 7. a) Intraoral image of the patient after 1 year, b) Intraoral image after 2 years

DISCUSSION

Free gingival grafts are the most effective mucogingival surgical procedure used to increase the width of insufficiently keratinized gingiva and are frequently preferred to cover the root surface when there is an appropriate indication.[14,15]

It is known that complete root surface closure can be obtained in mucogingival surgical procedures to be performed

especially in patients without bone loss at the interfaces such as Miller class 1 and 2.[7,16] There are not many publications reporting success rates after surgeries performed in Miller class III gingival recessions in which a partial root surface closure is predicted due to the presence of attachment loss and periodontal bone loss in the interdental area.[17] However, complete root surface coverage has been achieved in Miller class 3 cases by applying different surgical techniques. Recent studies suggest that patients with interproximal bone loss can also be treated successfully.[15,17,18] For this, the width and height of the papilla in the interproximal area, limited interproximal bone loss, and an appropriate graft thickness are extremely important, Miller stated in a recent article.[19] Both of our patients had interproximal bone loss and Miller class III gingival recession. As stated in previous studies, despite the presence of bone loss, one of our patients had complete root surface coverage and the other had near complete root surface coverage.

The primary aim in free gingival graft applications is not to close the root surface; however, in narrow recessions with a width of less than 3'mm, root surface closure with creeping attachment can be realized both after surgery and over time.[8] Studies have shown different results regarding when creeping attachment starts after surgery and how long it continues. Many studies have argued that creeping attachment starts between 2 weeks and 6 months.[20,21] In addition to the studies suggesting that the end period is between 1 and 5 years, there are also studies suggesting that it continues for a longer period.[22] Therefore, there is no definite interval for the ideal follow-up period of creeping attachment and this period is uncertain.[10] Although it is not possible to say precisely when creeping attachment started the the coverage of the root surface increased significantly during the 2 years of observation.

CONCLUSION

In this case report, it was demonstrated that positive results can be obtained with free gingival grafting in patients with Miller class III gingival recession. Within 2 years, the depth of recession decreased, the amount of keratinized tissue increased and successful results were obtained in covering the root surface with creeping attachment.

ETHICAL DECLARATIONS

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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